## CLAIMS

1. A system of structural protection against electrical discharges, specially from lightning strikes, intended to fuel tanks that are fully or partially made of composite material and comprise an outer skin (I) of composite, an internal part (II) of either composite or metallic material and a row of metallic fasteners (III), each having a nut (T), which join the outer skin (I) with the internal part (II), the protection system consisting of a first metallic mesh (1) laid up on to the whole exterior surface of the outer skin (I), a second metallic mesh (2) located under the said mesh (1), a washer (A) placed between the nut (T) and the bottom of the internal part (II), and an organic finish (A.O.) that covers the entire external surface of the structure to be protected, including the row of fasteners (III), characterized in that:

- the mesh (1) is a thin metallic wire mesh laid up and cured simultaneously with the outer skin (I) of composite;

- the mesh (2) is a thick metallic wire mesh that covers the row of fasteners (III) overlaping the thin metallic mesh (1) up to a minimum of 50 mm at both sides of the row of fasteners (III), and has been put by simultaneously curing with the outer skin (I) of composite and subsequently drilling and countersinking for the installation of the fasteners (III) that allow the attachment of the outer skin (I) to the internal part (II); and

- the internal part (II) being made of metallic material, the protection system also includes a metallic countersunk washer (3 ) installed to the row of fasteners (III) every 200 mm at the gap existing between the fastener (III) and the section built up by the outer skin (I) and the internal part (II) to be attached.

2. A system as in claim 1, characterized in that both the thin and thick metallic meshes (1) and (2) are made of bronze and the composite of the outer skin (I) consists of carbon fibre material and epoxy matrix.

3. A system as in claims 1 and 2, characterized in that the washer (A) is made of isolating material if the internal part (II) is composite while the said washer (A) is metallic if the internal part (II) is also metallic.

4. A system as in claims 1 trough 3, characterized in that it also includes an isolating ply (F.V.) of fibreglass material or any other isolating material if the internal part (II) is metallic.

5. Process for manufacturing the structural protection system against lightning strike as described in claims 1 through 4, comprising the following steps:

- fabrication of the outer skin (I) of composite together with the lay-up of carbon fibre material plies as required up to achieving the thickness specified, during which, in addition to the plies of above noted composite material, the resulting lay-up is subjected to a cure cycle simultaneously with:

- the thin bronze mesh (1) put onto the external surface of the outer skin (I) covering the whole external surface.

- the thick bronze mesh (2) put in line with the fastener row overlapping the thin bronze mesh at a distance not less than 50 mm to both sides of the row of fasteners (III) and in the external face of the outer skin (I),

- a ply (F.V.) of fibreglass or any other isolating material put onto the internal surface of the outer skin (I), covering the required distance that avoids contact to the internal part (II) to be fastened onto the outer skin (I);

- location of the internal part (II) to be fastened as well as drilling and countersinking appropriately practised to the external surface of the inner skin (I);

- installation of the washers (3) if the internal part (II) is metallic and subsequent installation of the fastener (III) with the appropriate washer (A) and nut (T) if applicable;

- application of a coat of exterior organic finish (A.O.) such as a coat of paint material.